REMARKS

Claims 1-31 were previously pending in the application. Claims 4, 7, 14, and 22-27 are canceled; claims 1, 19, 28 are amended; and new claims 32-36 are added herein. Assuming the entry of this amendment, claims 1-3, 5-6, 8-13, 15-21, and 28-36 are now pending in the application. The Applicants hereby request further examination and reconsideration of the application in view of the foregoing amendments and these remarks.

Previously withdrawn from consideration claims 14 and 22-27 have been canceled due to a restriction requirement.

On page 2 of the office action, the Examiner rejected claims 1-13, 15-21, and 28-31 under 35 U.S.C. § 103(a) as being unpatentable over Newman in view of Krins. For the following reasons, the Applicants submit that all pending claims are allowable over the cited references.

Claim 28 has been amended to correct an inadvertent typographical error. Claim 28 is not amended to overcome a prior-art rejection. The same typographical error has also been corrected in claims 1 and 19. That particular amendment in each of claims 1 and 19 is not made to overcome a prior-art rejection.

Support for the amendment of independent claim 1 can be found, e.g., in original claim 4 (now canceled), on page 4, lines 34-35, and on page 5, lines 1-2. Independent claim 19 is amended similar to claim 1. Support for new claims 32, 34, and 36 can be found, e.g., in Applicants' Fig. 1 and on page 5, lines 1-2 and 5-8. Support for new claims 33 and 35 can be found in claim 11.

Claim 1 is directed to a method for assembling carbon particles into at least one fiber. The method has the steps of: (I) aligning said carbon particles by flowing a mixture of said carbon particles and a curable liquid down a tapering tube starting at a first end of said tapering tube; (II) curing said flowing mixture at least near a second end of said tapering tube whereby a fiber is formed, wherein said fiber comprises said carbon particles and a solidified portion of said curable liquid; and (III) heating said fiber so as to cause volatile elements of the solidified portion to substantially dissipate from the fiber.

Newman discloses a method of forming a composite carbon fiber from a mixture containing carbon nanotubes and a matrix material. The mixture is introduced into a hopper of melt blowing equipment and extruded into a high-velocity gas stream. The force of the high-velocity gas stream stretches the extruded material into a composite fiber having a diameter between about 0.1 and 30 micron. (See Newman's col. 4, lines 24-39.)

On page 4 of the office action, in the rejection of original claim 4, the Examiner stated that "Newman teaches heating the fiber mixture, which has been mixed in a solvent, such as toluene, to evaporate (dissipate volatile elements) (col. 5, lines 1-8)." Although this statement is a correct characterization of the teachings of Newman, it constitutes an improper basis for the rejection of original claim 4 or amended claim 1. This is because Newman talks about adding toluene to the nanotube/matrix mixture to facilitate homogenization of that mixture through sonication. Importantly, the toluene is removed from the mixture **before** it is extruded from the hopper and **stretched into a fiber**. In this regard, the Applicants note that the very passage in Newman, upon which the Examiner relies in the rejection, explicitly states that "The deformable mixture **25** is then warmed to **evaporate the solvent-toluene and thereafter introduced into the hopper 14** of the melt blowing equipment **10**." (See Newman's col. 5, lines 6-8; emphasis added.)

In contrast, claim 1 specifically requires that the fiber, **not** the antecedent mixture, as in Newman, be heated so as to cause volatile elements to substantially dissipate from the fiber (not from the antecedent mixture, as in Newman).

Krins discloses a method of making graded-index polymeric optical fibers. The method employs a multi-component spinning process to join a core mass and a sheath mass. Each of these masses consists of a polymer, a polymerizable monomer, and an initiator chosen to provide a proper index gradient between the core and sheath. The two masses are spun, extruded into an inert gas or liquid, and cured by UV light to form an optical fiber. The Applicants submit that Krins does not teach or even suggest a processing step that can serve as an example of "heating said fiber so as to cause volatile elements of the solidified curable-liquid portion to substantially dissipate from the fiber," as explicitly recited in claim 1.

For all these reasons, the Applicants submit that claim 1 is allowable over the cited references. For similar reasons, the Applicants submit that claims 19 and 28 are also allowable over the cited references. Since the rest of the claims depend variously from claims 1, 19, and 28, it is further submitted that those claims are also allowable over the cited references. The Applicants submit therefore that the rejections of claims under § 103 have been overcome.

Claim 11, which depends from claim 1, further specifies that the curable liquid comprises at least one of the group consisting of: (i) a copolymer of (a) methylmethacrylate with (b) the ester of methacrylic acid and anthaceyl methanol; and (ii) PS2067.

> On page 5 of the office action, in the rejection of claim 11, the Examiner stated that: Newman teaches that the matrix material (curable liquid) and properties of deformation including stretching and shearing depend on the materials used (col. 3, lines 16-38). Hence it is submitted that the curable liquid mixture is a result-effective variable. [Citations omitted.] Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use routine experimentation to determine an optimum curable liquid mixture in the process of Newman because Newman specifically teaches that the deformation properties of the matrix material (curable liquid) depends on materials used, and as such teaching the curable liquid is a result-effective variable.

For the following reasons, the Applicants submit that this rejection is improper and should be withdrawn.

The group recited in claim 11 consists of materials that are chosen for being (1) curable under UV light and (2) when heated in the cured form, amenable to conversion into volatile elements that can dissipate from the fiber (see the specification, e.g., at page 4, line 17, through, page 5, line 2). The Applicants submit that neither of these considerations is even remotely present in Newman because Newman does not teach or even suggests the use of UV-curable matrices. It is therefore submitted that a matrix-material search and optimization based on "properties of deformation including stretching and shearing" suggested by the Examiner would not lead to the discovery of the group recited in claim 11. Thus, the above-cited rejection lacks justification and, as such, is improper.

The teachings of Krins do not rectify the above-stated deficiency of Newman with respect to claim 11. First, while it is true that Krins teaches the use of UV-curable masses in optical fibers, it is also true that Krins does not specifically disclose any of the materials recited in claim 11. Second, the "result-effective variable" rationale articulated by the Examiner on page 5 of the office action would not lead one of ordinary skill in the art, without undue experimentation, to the discovery of the group recited in claim 11 because, for the purposes of Krins, a possible material search and optimization would be constrained by such considerations as whether the refractive indices are suitable for light-guiding purposes and whether the respective curing and inter-diffusion rates result in the desirable index profile (see, e.g., Krins' col. 9, lines 23-38). If anything, the

materials in Krins would likely be chosen to be relatively resistant to heat-induced dissipation, e.g., to give the nascent optical fibers reasonable durability. The latter criterion is an exact opposite of the above-stated volatility criterion relevant to the group recited in claim 11. All these facts provide additional reasons for the allowability of claim 11 over the cited references.

Each of new claims 33 and 35, which depend from claims 28 and 19, respectively, recites limitations that are analogous to the above-cited limitations of claim 11. It is therefore submitted that at least some of the above-stated reasons are also applicable to the allowability of claims 33 and 35.

New claim 36, which depends from claim 1, further recites the step of "substantially removing the solidified [curable liquid] portion so that said fiber consists essentially of **said** carbon particles." This means that a fiber manufactured in accordance with claim 36 consists essentially of carbon particles already contained in the original mixture of the carbon particles and curable liquid flowing down the tapering tube (see claim 1).

Newman discloses that the matrix material can be subjected to pyrolysis to convert the matrix material into carbon (see Newman's col. 6, line 61, through col 7, line 14). However, this processing step of Newman is different from that recited claim 36 because the pyrolysis **adds new carbon particles** to the carbon nanotubes originally present in the antecedent mixture. In contrast, claim 36 requires that the resulting fiber consists essentially of "said" (i.e., originally present) carbon particles. These facts provide additional reasons for the allowability of claim 36 over the cited references.

Each of new claims 32 and 34, which depend from claims 28 and 19, respectively, recites limitations that are analogous to the above-cited limitations of claim 36. It is therefore submitted that at least some of the above-stated reasons also serve as additional reasons for the allowability of claims 32 and 34 over the cited references.

In view of the above amendments and remarks, the Applicant believes that the now-pending claims are in condition for allowance. Therefore, the Applicants believe that the entire application is now in condition for allowance, and early and favorable action is respectfully solicited.

Respectfully submitted,

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